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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Yang Gao

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EXAMINER

SERROU, ABDELALI

ART UNIT

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2626

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/799,503	Applicant(s) GAO, YANG	
	Examiner Abdelali Serrou	Art Unit 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-12,14-22,24-28 and 30-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-12,14-22,24-28 and 30-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. In response to the advisory office action mailed on 8/25/08, applicant filed an RCE amending claims 112, 22, and 28, and canceling claims 2, 13, 23, and 29. The pending claims are 1, 3-12, 14-22, 24-28, and 30-45.

Response to Arguments

2. Applicant's arguments filed on 8/18/08 have been fully considered but they are not persuasive.

Applicant argues that Kroon does not teach does transmitting a voicing index indicative of one of a plurality of classes of said input speech signal, wherein each of said plurality of classes of said input speech signal represents a different degree of periodicity of said input speech signal. The examiner respectfully disagrees and points out that if a decoder is a device which does the reverse of an encoder, undoing the encoding so that the original information can be retrieved. The same method used to encode is usually just reversed in order to decode. An application uses a decoder would ideally require an encoder because a decoder functions the reverse of an encoder. It is a device that decodes what has been encoded by the encoder. Hence, if Kroon's decoder uses a voicing classifier, Kroon's encoder must use a voicing classifier. Furthermore, Kroon, at col. 6, lines 15-21, confirms hat his decoder is much like his encoder, wherein FCB and ACB parameters are transmitted from the encoder to the decoder including periodicity models. Also, col. 6, lines 23-36, wherein PPF, FCB and ACB parameters, including

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voicing, pitch period, gain, and LSP coefficients indexes are transmitted from the encoder to the decoder through the system's channels.

Applicant submits that if Kroon's encoder transmits a voicing index, as defined in claim 1, there is no reason for Kroon's decoder to do calculations for classifying the speech signal again, as Kroon's decoder would simply use the voicing index received from the encoder. The examiner points out that the voice classification mentioned under the decoder section, columns 29-30 is meant to be for the purpose of error concealment procedure performed only on erased frames or corrupted frames by random bit error. Furthermore, Kroon states at col. 3, lines 17-25 that he provides a gain for the PPF (Pitch Prediction Filter), which is a part of the encoder, based on the periodicity measure of the speech signal. Therefore, Kroon's encoder does provide the decoder with

In addition, applicant submits that Kroon fails to disclose new elements of claim 1, as amended, which recites "classes of said input speech signal include a background noise class, an unvoiced class, a first voiced class, and a second voiced class, wherein said first voiced class has a lower degree of periodicity than said second voiced class." The examiner points out that the background noise class, unvoiced class is considered non-periodic class (col. 30, lines 12-13, and lines 66-67, wherein a background noise or unvoiced (non periodic) frame is declared), and voiced classes of different degrees of periodicity (see col. 30, lines 11-12, wherein a periodic frame is declared, and col. 1, lines 15-19, wherein the degree of periodicity of speech frames is either less than or equal to adaptive filter codebook; col. 1, lines 43-51, wherein the pitch period of the voiced speech is sometimes greater than or equal to the sub-frame size, and sometimes is

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less than the sub-frame size; col. 3, lines 17-25, wherein the speech signal sometimes is not too periodic and sometimes is highly periodic).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-10, 12, 14-20, 22, 24-26, 28, 30-32, and 34-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Kroon (USPN 5,664,055).

Regarding **claim 1**, Kroon discloses a method of improving synthesized speech quality in a speech coding system including an encoder and decoder, said method comprising:

obtaining an input speech signal by said encoder (speech signal; column 1, lines 43-64 with column 6, lines 2-14);

coding said input speech signal by said encoder using a Code Excited Linear Prediction coder to generate coding parameters for synthesis of said input speech signal (ABC; column 4, lines 18-64);

generating a plurality CELP speech frames by said encoder, each of said plurality CELP speech frames including said CELP coding parameters (CELP; column 1, lines 43-64);

creating a plurality voicing indexes by said encoder, wherein each of said plurality of voicing indexes is indicative of one of plurality of classes of said input speech signal, wherein each of said plurality of classes of input speech signal represents a different degree of periodicity of said input speech signal (index; column 1, lines 43-64 and (measure of periodicity of the speech

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signal; abstract with column 1, lines 22-26, col. 3, lines 17-25, and column 30, lines 55-65)

wherein said plurality of class~ of said input speech signal include a background noise class, an unvoiced class, a first voiced class, a second voiced class, wherein said first voiced class has a lower degree of periodicity than said second voiced class (background noise class, unvoiced class is considered non-periodic class (col. 30, lines 12-13, and lines 66-67, wherein a background noise or unvoiced (non periodic) frame is declared), and voiced classes of different degrees of periodicity (see col. 30, lines 11-12, wherein a periodic frame is declared, and col. 1, lines 15-19, wherein the degree of periodicity of speech frames is either less than or equal to adaptive filter codebook; col. 1, lines 43-51, wherein the pitch period of the voiced speech is sometimes greater than or equal to the sub-frame size, and sometimes is less than the sub-frame size; col. 3, lines 17-25, wherein the speech signal sometimes is not too periodic and sometimes is highly periodic); and

transmitting each of said plurality of voicing indexes as part of each of said plurality of CELP speech frames by said encoder (encoder) to said decoder (decoder) for enhancing said synthesis of said input speech signal (column 1, lines 43-64 with column 4, lines 49-64 and column 6, lines 2-14).

Regarding **claim 2**, Kroon discloses a method and encoder wherein said plurality of classes of said input speech signal includes a background noise class, an unvoiced class (inherently disclosed within the process of speech synthesis and recreation of appropriate speech waveforms), a first and second voice class, wherein the first voiced class has a lower degree of periodicity than the second voiced class (col. 30, lines 55-65).

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Regarding **claims 3 and 14**, Kroon discloses a method and encoder wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive highpass filter by said decoder (highpass filter; column 4, lines 49-64 and column 27, lines 49-67).

Regarding **claims 4 and 15**, Kroon discloses a method and encoder wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive perceptual weighting filter by said decoder (adaptive perceptual weighting filter; column 8, lines 39-54).

Regarding **claims 5 and 16**, Kroon discloses a method and encoder wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive Sinc window by said decoder (Sinc; column 20, lines 4-15).

Regarding **claims 6 and 17**, Kroon discloses a method and encoder wherein said enhancing at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling spectrum tilt (spectral envelope tilted; column 17, lines 29-35) of said input speech by short-term enhancement of a fixed-codebook by said decoder (short-term; column 8, lines 31-37).

Regarding **claim 7**, Kroon discloses a method and encoder wherein said enhancing said synthesis of at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a perceptual weighting filter by said decoder (column 4, lines 49 – column 5, line 8).

Regarding **claims 8 and 18**, Kroon discloses a method and encoder wherein said enhancing at least one of said plurality of voicing indexes provides information from said

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encoder to said decoder for controlling a linear prediction coder by said decoder (LP; column 4, lines 49-64).

Regarding **claims 9 and 19**, Kroon discloses a method and encoder wherein said enhancing said synthesis at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a pitch enhancement fixed-codebook by said decoder (fixed codebook coupled to a pitch filter; abstract and column 27, lines 11-17).

Regarding **claims 10 and 20**, Kroon discloses a method and encoder wherein said enhancing said synthesis of at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling post pitch enhancement by said decoder (postfiltering; column 27, lines 49-67).

Regarding **claim 12**, Kroon discloses a method and encoder of improving synthesized speech quality in a speech coding system including an encoder and a decoder, said method comprising:

receiving a plurality of Code Excited Linear Prediction (CELP) speech frames by said decoder from said encoder (CELP; column 1, lines 43-64);

obtaining a plurality of CELP coding parameters by decoding each of said plurality of CELP speech frames by said decoder (decoder; column 1, lines 43-64);

obtaining a plurality of voicing indexes by decoding each of said plurality of CELP speech frames by said decoder for use by said decoder for enhancing synthesis of said input speech signal, wherein each of said plurality of voicing indexes (index) relates to a characteristic of input speech signal (column 1, lines 43-64 with column 4, lines 49-64 and column 6, lines 2-14);
and

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generating a synthesized version of said input speech signal using said plurality of CELP coding parameters and said plurality of voicing indexes by said decoder (column 1, lines 43-64 with column 4, lines 49-64 and column 6, lines 2-14).

Regarding **claims 34 and 37**, Kroon discloses a method and encoder wherein each of said plurality of voicing indexes has a plurality of bits indicative of a classification of each frame of said plurality of CELP speech frames (column 23, lines 31-59).

Regarding **claims 35 and 38**, Kroon discloses a method and encoder wherein said plurality of bits are three bits (3 bits; column 23, lines 29-33).

Regarding **claims 36 and 39**, Kroon discloses a method and encoder wherein said classification is indicative of periodicity of said input speech signal (periodicity classification; column 30, lines 1-65).

Regarding **claim 42**, Kroon discloses a method and encoder wherein said classification is indicative of a noisy speech signal (buzzyness; column 3, lines 17-25).

Regarding **claims 45**, Kroon discloses a method and encoder wherein said periodic index ranges from a low periodic index to a high periodic index (column 30, lines 1-65).

Regarding claims 22, (24, 30), (25, 31), (26, 33), 28, (40, 43), 41, and 44: respective system claims 1, (3,14), (4,15), (5,16), 12, (34,37), (35,38), (36,39) and method claims 22, (24, 30), (25, 31), (26, 33), 28, (40, 43), 41, and 44 are related as apparatus and the method of using same, with each claimed element's function corresponding to the claimed method step.

Accordingly claims 22, (24, 30), (25, 31), (26, 33), 28, (40, 43), 41, and 44 are similarly rejected under the same rationale as applied above with respect to method claims 1, (3,14), (4,15), (5,16), 12, (34,37), (35,38), (36,39).

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Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11, 21, 27 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kroon in view of Morii et al. (PGPUB 2006/0206317), hereinafter referenced as Morii.

Regarding **claims 11, 21**, Kroon discloses a method of improving synthesized speech quality, but does not specifically teach a method and encoder wherein at least one of said plurality of voicing indexes is for use by said decoder to select at least one sub-codebook from a plurality of sub-codebooks.

Morii discloses a method and encoder wherein at least one of said plurality of voicing indexes is for use by said decoder to select at least one sub-codebook from a plurality of sub-codebooks (subcodebooks; column 8, paragraphs 0109-0110 with column 4, paragraphs 0049-0056), to achieve an excellent sound quality at the time of decoding.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kroons method and encoder as described above, to correspond to input signals with carious characteristics and achieve excellent sound qualities at the time of decoding (abstract).

Regarding claims 27 and 33, system claims 11 and 21 and method claims 27 and 33 are related as apparatus and the method of using same, with each claimed element's function

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corresponding to the claimed method step. Accordingly claims 27 and 33 are similarly rejected under the same rationale as applied above with respect to method claims 11 and 21.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abdelali Serrou whose telephone number is 571-272-7638. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Hudspeth can be reached on 571-272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Abdelali Serrou/
Examiner, Art Unit 2626
11/7/08

/David R Hudspeth/
Supervisory Patent Examiner, Art Unit 2626